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AUTHOR Fine, Thomas W.
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ABSTRACT

This model for solving educational problems consists of four major steps: (1) the problem is defined and verified; (2) solution criteria are established; (3) solution alternatives are surveyed; and (4) a solution is selected. "Problem" is defined as the discrepancy between an existing condition and a desired condition. This model is to be implemented by a problem-solving team, which consists of representatives of the parties affected by the problem, individuals with the appropriate expertise in the problem area, and individuals who are objective and skilled in problem-solving. After a preliminary statement of the problem, it is broken down into components that allow the team to define who is involved and when and where the problem occurs. Next, solution criteria (the "musts" and "shoulds" necessary for a good solution) are defined, along with constraints. A survey of the relevant literature, as well as consultation with experts and field tests, should be conducted. After a solution is selected, it must be field tested. Then the solution is modified and refined to conform to the findings of the field study. (Author/DS)

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GUIDE TO EDUCATIONAL PROBLEM SOLVING

Dr. Thomas W. Fine
Professor of Education
September, 1976

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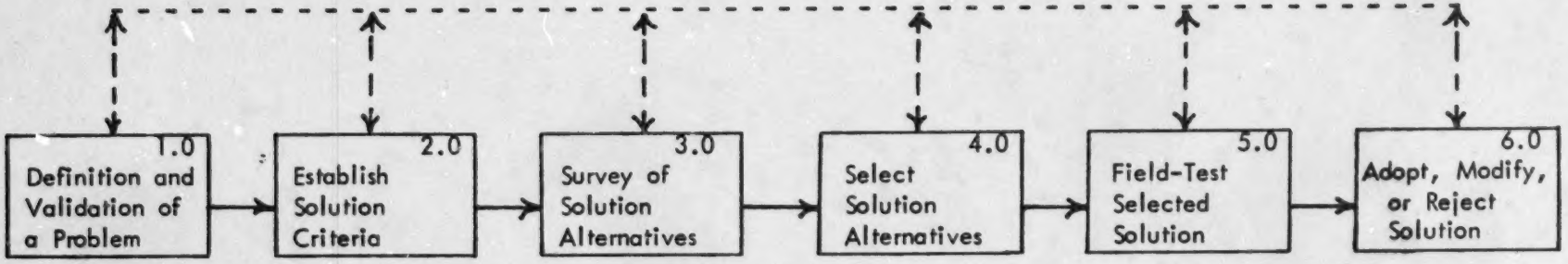
PROBLEM-SOLVING MODEL



A SYSTEMATIC APPROACH TO PROBLEM SOLVING

INTRODUCTION

How can administrators be relatively certain that such changes as flexible scheduling, differential staffing, or the language experience approach to reading will actually resolve specific problems? How can they determine if these new solutions are any better than previous solutions? One effective method of problem solving is the step by step procedure explained in detail in this chapter. Once the problem solving team has been selected and has outlined the problem in rough form, the team's approach to finding the best solution includes four major steps: (1) the problem is defined and verified; (2) solution criteria are established; (3) solution alternatives are surveyed; (4) a solution is selected.

Throughout this sequence the problem solving team must constantly keep in mind the educational needs of the students. When a problem is identified which is not linked directly to student learning (such as staff morale, custodial services, or community concerns), it would be desirable to point out how student welfare would be served by solving the issue under consideration. It may even be possible to collect empirical evidence that such peripheral problem areas do, in fact, affect student learning for the better or for the worse.

But even when solutions are identified through a systematic approach constantly associated with the needs of students, the solution itself may turn into a secondary problem. An example of such a dual problem follows:

The first problem might be:

> How can the school district resolve the issue of negative attitudes among upper grade students toward reading? This problem might conceivably result in the following solution: Implement a language experience approach to reading.

The secondary problem might be:

> How can the district implement the language experience approach in a manner which will improve attitudes among upper grade students toward reading, minimize teacher and parent anxiety, and maintain or improve reading achievement scores?

A systematic procedure for problem solving can help administrators foresee and plan for such dual problems as well as other potential trouble areas.

The Problem Solving Team

The selection of team members is a critical consideration and should be approached with deliberation. The problem solving team members should include (1) representatives from the affected parties, (2) members with expertise in the area under consideration, and (3) members known to be objective, task oriented, and skilled in problem solving.

Since the problem solving team is expected to work within a democratic small group setting, it is important that the leadership be aware of his/her role in this process. An autocratic atmosphere is unlikely to generate creative solutions.

There may be times that the problem solvers will want to gain some familiarity with the problem area prior to entering into the problem solving sequence. This may be accomplished, for example, through reading, visitations, or discussion sessions.

Preliminary Statement of the Problem

The team's initial task is the development of a preliminary statement of the problem area to be investigated. The team should draft a brief, general statement of the problem, trying to include the components of who and what are involved in the problem. The problem area under consideration should be presented in the form of a question:

1. How can Union High School reduce student alienation by twenty percent over the next three years?

2. How can Union High School implement a flexible schedule in a manner which will result in student, staff, and community commitments and reduce student alienation by twenty percent?

Note that problems one and two follow a logical dual sequence of problem solving from primary assessment through implementation of a solution.

Flexible scheduling was a solution to problem number one; this solution in turn became the problem to be solved by question number two.

If the problem solvers had started with problem number two, there would be little or no basis upon which to evaluate the relative success of the solution. The alienation factor had to be established as a prerequisite to the final solution phase of the sequence.

Translate the Problem Statement into Components

In order to provide a basis for the systematic analysis of a problem, it is necessary to extrapolate problem components. Components of a problem area may either be

expressed or implied in the problem statement. A number of components are implied in the preliminary statement of this problem:

> How can Union High School reduce student alienation by twenty percent over the next three years?

Problem Components

Administration	Sex	Student Dropouts
Curriculum	Student Ability	Student Grades
Definition of Alienation	Student Achievement	Suspensions
Instruction	Student Attendance	Teacher-Attitude
Involvement in School Attitudes	Student Attitudes	What Students: grade level, sex, etc.
Parental Attitude	Student Background	

Once the components of the problem have been established, it is necessary to make a distinction between cause and effect. Some of the components relate to potential causes or potential solutions; others relate specifically to the problem If this distinction is not established at the outset of the problem solving process, the team runs the risk of becoming diverted from the problem to be resolved.

The following classification of the components of the sample problem illustrates this process:

Components Related to Potential Causes or Solutions	Components Related to the Problem
Administration	Continued Education
Curriculum	Definition of Alienation
Instruction	Student Achievement
Student Abilities	Student Attendance
Student Background	Student Attitude
Teacher Attitude	Student Dropouts
	Student Grades
	Suspension
	What Students: grade level, sex, etc.

SECTION 1.0

DEFINITION AND VALIDATION OF A PROBLEM

Step one, defining the problem, represents the most difficult aspect of problem solving and is the step most often shunned. In the absence of a thorough analysis of the problem, one is never quite sure if the SOLUTION adopted is appropriate or even relevant to the problem at hand.

But before beginning systematic analysis of their specific problem, the team should have a working definition of a problem in general. An operational definition of a problem for the purposes of this guide is the disparity which exists between (1) an EXISTING CONDITION and (2) a DESIRED CONDITION. This definition is not limited to the field of education. In fact, it is quite universal and may apply to problems in most areas of endeavor. The following examples will serve to illustrate the universality of the definition:

AREA	EXISTING CONDITION	DESIRED CONDITION	DISPARITY OF PROBLEM
ECONOMICS	$80 million deficit	Budget not to exceed 30 million deficit for U.S. Government	$50 million disparity
ECOLOGY	Stream contamination renders water unfit to drink	Water from stream drinkable	Render water from stream drinkable
EDUCATION	75% of high school students complete high school	95% of high school age students complete high school	20% student dropout disparity

It should be noted that an EXISTING CONDITION is based on unified facts and not on contentions or assumptions. On the other hand DESIRED CONDITIONS represent value judgments on the part of individuals or groups. A critical task of the problem solving team is to gain a consensus of what CONDITIONS are DESIRED. When there is agreement on DESIRED CONDITIONS and when there is obviously a disparity from the EXISTING CONDITIONS, then the team has a broad working definition of a problem.

The major task of defining and validating a problem is two fold: One, to specify in very exact terms what the EXISTING CONDITIONS are and two, to determine in very exact terms what CONDITIONS are DESIRED. The following set of activities is addressed to problem definition and problem verification:

1.1 Isolate and Validate Existing Conditions of Problem

The specific conditions surrounding a problem require careful analysis in an effort (1) to focus on the specific problem and (2) to collect data required to document the problem. Since most problems in education are predominately people problems, questions of WHO, WHEN and WHERE of the problem components will generate the type of information required to specify the existing condition. The components identified from the initial problem statement will assist in this process.

1.1.1 WHO is Involved in the Problem?

The identification of WHO is involved or associated with the problem will greatly clarify the problem. Invariably the notion that everybody is involved in a given problem is expressed by those concerned. For example: "All students hate reading;" "Everyone was talking during the performance;" "Students just can't spell as well as when I went to school."

Common sense and experience tells us that these statements represent false generalizations. Consequently, we must systematically record WHO is involved or associated with the problem area.

1.1.2 WHEN Does the Problem Occur?

Similar to the tendency to over-generalize about WHO is involved, the same may be said for the question of WHEN a given problem occurs: "Every day they come late to class;" "They are always closed to ideas;" "The district office is always late notifying us." Of course, these statements are not descriptive of the actual situation. Discussion and data collection should be directed to analyzing WHEN, specifically, the problem occurs.

1.1.3 WHERE Does Problem Occur?

"The total school is filled with litter;" "They avoid learning wherever they go;" "The restrooms are a disgrace to the school." Again, a careful analysis of the actual situation will pinpoint where the problem occurs. Figure 1 will assist in isolating and validating EXISTING CONDITIONS.

1.2 Establish Desired Conditions of Problem

Once the EXISTING CONDITIONS have been established, the problem solving team may review each component and render a value judgment as to what CONDITIONS are desired. The following format may be used to describe and summarize the problem under investigation:

PROBLEM COMPONENTS	EXISTING CONDITIONS (Based on Facts)	DESIRED CONDITIONS (Value Judgments)
	1.	1.
	2.	2.
	3.	3.
	4.	4.
	Etc.	Etc.

It is imperative that problem solvers are able to differentiate between problems and solutions; it is common to have solutions presented as problems. However, the careful selection of a problem solving team (see above) can help avoid this tendency toward confusion.

1.3 Summary

An operational definition of a problem is the disparity between an existing condition (what is) and a desired condition (what should be). Since the existing condition is a matter of identifying the specific facts of the situation, it is necessary for the problem solvers to collect information in an objective manner. The desired condition, on the other hand, is a matter of value judgment. If there is a consensus as to what the situation should be among those associated with the problem area, then a problem has been formulated.

The identification and validation of a problem represents the most difficult step in problem solving. If ample time and effort are devoted at this stage, the ultimate resolution of the problem will be greatly facilitated.

ISOLATION AND VALIDATION OF EXISTING CONDITIONS

PROBLEM COMPONENTS	WHO IS INVOLVED	WHEN DOES IT OCCUR	WHERE DOES IT OCCUR	OTHER
1.				
2.				
3.				
4.				
Etc.				

FIGURE I

SECTION 2.0

ESTABLISH SOLUTION CRITERIA

Locating the most appropriate solution from an array of possible approaches represents a task almost as difficult as defining the problem. Two major considerations must be taken into account in this search: (1) the DESIRED CONDITIONS required of the solution and (2) the SOLUTION CONSTRAINTS, the fiscal and non-fiscal limitations to be considered. An analysis of these two considerations will result in criteria for seeking out and evaluating possible alternative solutions.

2.1 Desired Conditions

The DESIRED CONDITIONS specified during the problem definition phase may now be included as criteria in the search for and selection of a solution.

2.1.1 Establish MUSTS and SHOULDS for the DESIRED CONDITIONS

Because those affected directly by the problem need to be satisfied with the solution in order that it be effective, the problem solving team should obtain a consensus from those closest to the problem as to which of the DESIRED CONDITIONS MUST be obtained by the solution and which SHOULD be obtained.

If a component is given a designation of MUST, it may not be compromised when seeking a solution. A component with a designation of SHOULD may be compromised to some degree. This activity will establish acceptable limits to be considered when reviewing solution alternatives.

The following is an example of DESIRED CONDITIONS with established MUSTS and SHOULDS:

PROBLEM AREA: How can school vandalism be minimized?

1. The solution MUST result in the overall reduction of vandalism costs by 30 percent.

2. The solution MUST reduce the incidence of gratfiti during the school day by 50 percent.

3. The solution SHOULD reduce the incidence of broken glass during non-school hours by 50 percent.

4. The solution SHOULD reduce school breakins during non-school hours by 75 percent.

2.2 Identify SOLUTION CONSTRAINTS

In the review of possible solution alternatives it will become obvious, for example, that financial factors, legal aspects, or political considerations must be considered in the selection of one alternative over another. There is nothing more disheartening than to identify what appears to be an ideal solution, only to be informed that it is out of the question because of costs.

The early identification of constraints in the form of funds or personnel not only wards off disappointment among the problem solvers, but also offers concrete guidance in reviewing alternatives. The same may be said of legal considerations, as well as possible constraints imposed on the staff by political pressures. Every effort should be addressed to the early, accurate identification of all possible constraints, regardless of the source.

The following are examples of CONSTRAINTS:

1. The final solution may not cost more than $5,000 per school year to implement.

2. The final solution must be acceptable to the Parent Advisory Council.

3. The final solution must not interfere with the ongoing instructional program.

4. The final solution must be endorsed by the staff if they are to be involved.

It is important that the listed constraints be verified as to their legitimacy. If this is not done, the team runs the risk of limiting potential solution areas unnecessarily.

2.3 Summary

Solution criteria represent a combination of (1) desired conditions established in Step 1 of the problem solving sequence, and (2) identified constraints.

The purpose of establishing solution criteria is to provide a framework within which potential solution alternatives may be considered, evaluated, and ultimately adopted. This step also provides those to be affected by the final solution an opportunity to give concrete direction to the solution search. It represents, in a sense, a check point at which the problem solvers may reconfirm with others (the board, the community, the administrators, the staff) exactly what their purpose is and whether or not the direction they have taken is valid.

SECTION 3.0

SURVEY OF SOLUTION ALTERNATIVES

The extent to which the team will survey possible sources of solution alternatives will, of course, depend on the magnitude and complexity of the problem. It is conceivable that a given problem may require a solution generated from no more than one or two brainstorming sessions among colleagues. On the other hand, extremely complex and critical problems may involve systematic review of the literature, hiring of consultants, and field-visits to sources dealing with similar problems.

3.1 Review of the Literature

Since most problems in education have been faced by others, the literature in the form of periodicals is an excellent reference source. There are more than six hundred journals in education and related fields, many of which are devoted to discussions of educational problems and solutions.

The initial step in a search should be a visit to a college library; the librarians will acquaint the researcher with appropriate indexes to journal articles, such as Current Index to Journals in Education (CIJE), or Educational Index.

The initial components of the problem will provide guidance in the identification of subject headings in the indexes. These, in turn, will lead to articles which appear to be appropriate for the problem at hand. When several promising articles have been identified, they may be duplicated and distributed to the problem solving team for study. This same procedure may be used in reviewing and identifying appropriate material listed in Educational Resources Information Center (ERIC). The ERIC material may be obtained in the form of microfiche or in hard copy through the source listed in the ERIC Educational Documents Index.

Another method of identifying appropriate literature material is through a computer center search. The San Mateo Educational Resources Center (SMERC) and the Los Angeles Center for Education Resource Services (LANCERS) are two such centers. Contacts to either of the county offices will provide additional information on the use of these centers.

3.2 Consultants and Field Visits

Consultants may be identified within or outside the district. After the problem has been defined and verified, those who might be of greatest assistance can be contacted.

It should be recognized that an invaluable consultant resource may be visits to schools, programs, or districts that have had similar problems and have evidently resolved them.

SECTION 4.0

SELECT SOLUTION ALTERNATIVE

Following the systematic review of sources of solution alternatives is the task of selecting from several possible solutions alternatives the one which appears most suitable. The advantages of generating more than one solution to a problem include (1) forcing serious reflection on the part of the problem solvers, (2) reducing the odds of installing somebody's pet solution, and (3) demonstrating the potential power of systematic inquiry.

4.1 Express Each Solution Alternative in Writing

Each of the solution alternatives to be considered as a serious contender for problem resolution should be specified in writing. Since SOLUTION CRITERIA identified in Section 2.0 will serve as a guide in selecting the most promising alternative, the narration should be very explicit concerning these criteria.

There are several advantages in having different groups or individuals sponsor various alternatives. It will encourage greater diversity in approaches; it will promote authentic dialogue; it will assure that all sides of each issue will stand the test of careful examination.

4.2 Evaluate Each Solution Alternative Independently

The initial review of the alternatives should be on the basis of independent merit. Each alternative should be presented, discussed, debated, and evaluated before any attempt is made to render comparisons. This procedure will help insure that the integrity of each solution will not be compromised prior to a complete hearing.

Figure II provides a format which may be used to compare the solution alternatives against SOLUTION CRITERIA (DESIRED CONDITIONS and SOLUTION CONSTRAINTS).

4.2.1 Evaluate Against DESIRED CONDITIONS

The DESIRED CONDITIONS established in Section 2.1 may now be used as criteria in evaluating the relative viability of the individual solution alternatives. Each of the MUSTS specified in the criteria are to be used as questions requiring affirmative answers. If the solution under consideration does not satisfy the MUST criteria, it must either be abandoned or modified so that it meets the requirement.

Since DESIRED CONDITIONS are value judgments, they are subject to modification. A consensus among those affected by the problem may serve as the basis for modifying the DESIRED CONDITIONS. Obviously, any unilateral

decision to alter SOLUTION CRITERIA by a problem solver, an administrator, a professor, or another individual or group could jeopardize the successful implementation of the selected solution.

A further refinement in the evaluation of each alternative is ranking the solution requirement components. For example, as a solution under consideration is measured against each component, points between one to ten (ten representing the highest score) could be assigned to designate its relative importance.

4.2.2 Evaluate Against SOLUTION CONSTRAINTS

SOLUTION CONSTRAINTS are similar to MUST considerations in the DESIRED CONDITIONS since they too require an affirmative answer from the SOLUTION ALTERNATIVE. It is conceivable that a given constraint might be abandoned or modified in light of revised considerations on the part of those authorized to render such decisions. For example, additional funds might become available and assigned to the problem area when none existed originally. In any case, each constraint must either be satisfied or must be altered before a given SOLUTION may be considered further.

4.3 Select Solution Alternatives or Combination of Alternatives

When each SOLUTION ALTERNATIVE has been thoroughly reviewed and evaluated, the next step is to select the alternative or the combination of alternatives which hold the greatest promise of success. The ranking system suggested above should be considered as a reference point only; it is not meant to represent an absolute scoring. Obviously though, if a particular solution emerges as a finalist yet has a total score substantially below its competition, one might suspect a short-circuit in the process. On the other hand, when total scores are relatively close, they should not serve as the deciding factor.

4.4 Potential Problem Analysis

At this point it may be useful to analyze the selected SOLUTION ALTERNATIVE for potential adverse consequences. This analysis would be advisable when the particular problem area under consideration holds possible political ramifications. Examples of problem areas in this category might include (1) a district strike plan, (2) a tax or bond election, or (3) negotiating a contract with a personnel organization.

4.4.1 Identification of Potential Errors

Each of the solution components should be analyzed in terms of the possibility of something going wrong. A rating scale of one through three could be

assigned each component. A score of one suggests a negligible possibility of error; a score of three suggests potential error may well occur.

4.4.2 Identification of Potential Adverse Consequences

The solution components may now be analyzed for adverse consequences. The question to be answered is: If the particular solution component should error, what will be the consequences? If the consequences are negligible (score of one) then there may be no need for further deliberation. If the consequences suggest potential error (score of two) or potential disaster (score of three) then the problem solvers would want to develop contingency plans to cope with the situation should it materialize.

4.5 Designing Contingency Plans

The development of contingency plans for the solution components through analysis of both potential error and adverse consequences represents planning thoroughness. The process to be employed for this task is parallel to the original problem solving sequence. In a sense, the planning required in this step represents a mini problem solving effort.

4.6 Summary

It is important that more than one solution be identified as a potential approach to the resolution of the problem being considered. When several solution alternatives are evaluated against solution criteria, the chance of a creative approach to the problem is materially enhanced.

Once a solution alternative has been selected for field-testing, then the problem solvers should consider potential adverse consequences from the selected solution. This systematic analysis will help to mitigate against potential adverse consequences and will provide some guidelines in the event that adverse consequences do materalize.

EVALUATION OF SOLUTION ALTERNATIVES

DESIRED CONDITIONS:	Score	Score	Score
1.	1. ____	1. ____	1. ____
2.	2. ____	2. ____	2. ____
3.	3. ____	3. ____	3. ____
etc.	etc. ____	etc. ____	etc. ____
	Total ____	Total ____	Total ____
	Alternative #1	Alternative #2	Alternative #3

SOLUTION CONSTRAINTS:	Constraint Go/No-Go	Constraint Go/No-Go	Constraint Go/No-Go
1.	1. _____	1. _____	1. _____
2.	2. _____	2. _____	2. _____
3.	3. _____	3. _____	3. _____
4.	4. _____	4. _____	4. _____
etc.	etc. _____	etc. _____	etc. _____

FIGURE II

SECTION 5.0

FIELD-TEST SELECTED SOLUTION

Field-testing is a process of trying out a selected solution alternative to identify further refinement needs and to demonstrate its over-all worth as a solution. The value of a field-test, regardless of the magnitude of the problem, is both functional and psychological. By labeling a selected solution in a field-test, the problem solvers will be more inclined to make modifications of the alternative than they would if it were adopted as "the" solution. Although there are a number of approaches to field-testing, only two approaches are enumerated in the Guide: (1) the experimental research design and (2) the action research design.

5.1 Experimental Research Design

This approach requires the establishment of control and experimental groups from which data will be collected. The two groups should be "alike" in ways which might affect the outcome of the solution to be tested. For example, economic conditions, abilities, sex, and age, might have a direct bearing on the outcome regardless of the solution under study. In pairing or obtaining a control and experimental group, the relevant characteristics should be a similar in the two groups as possible.

The size of groups for conducting research is always a question and there are many factors to be considered in arriving at an ideal "sample." For most field-testing purposes, the control and experimental groups should consist of at least four classrooms, four schools, or four districts.

During the field-test period, the experimental groups will be exposed to one or more treatment conditions to solve the problem. The control group will continue to use the familiar solution strategy. The results from the experimental groups will then be compared with the control groups to discern the affect of the solution strategy (treatment conditions).

5.2 Action Research Design

The action research design is a means of internal progress measurement. Unlike the experimental approach, where progress of group "A" is measured against group "B", the action approach establishes where a population group is at the outset of the program (base-line data) and then measures progress against that entry point. An example would be assisting students reading scores in September; implementing a new reading approach; and then determining progress in June.

The action research approach has the advantage of enabling the problem solver to make corrections in the system during the research period. Monitoring is a means of sampling the population group to determine if progress is being achieved. Using the same example above, it would be easy and advisable to check the students reading progress each quarter to assess the progress being made and to determine if any corrections are necessary before progressing.

5.3 Assign a Field-Test Team and Establish a Schedule

In order to obtain reliable evidence, it is best to assign a team to evaluate the field-test. The team should be composed of representatives from all interested groups. If students are to be affected by the results and implications of the field-test, it would be beneficial if they (assuming an appropriate age level) were represented on the evaluation. The same rationale would hold for including community representatives on the evaluation team. Of course, it may be appropriate for the problem-solving team to assume this responsibility.

It is difficult to specify a given time schedule for all field-testing. So much depends on the nature of the problem. A month may be adequate to validate solutions addressed to an untidy campus or vandalism, whereas the merits of alternatives to cope with low student morale or with a major disparity between students ability to read and their actual reading scores may take several months or in excess of a year.

In any case, a schedule indicating (1) when the major activities of the solution alternative will be implemented; (2) what data is necessary and who will collect it; and (3) when progress reports are to be presented and by whom, should be translated into a printed schedule.

5.4 Summary

The assignment of a field-test phase in the problem solving sequence provides assurances that the selected solution(s) are effective in solving the problem under consideration. The type of research to be employed depends upon the nature of the problem and the resources available to address the problem at hand.

The majority of the field-tests will most likely favor the action research design as opposed to the experimental design. Action research provides the problem solvers with a functional approach to the resolution of situational problems. Since this approach lacks rigid controls of extraneous variables and allows changes during the field-test period, the results can not be generalized beyond the local setting. Nevertheless, action research provides an orderly framework within which significant changes may be implemented and evaluated.

SECTION 6.0

ADOPT, MODIFY, OR REJECT SOLUTION

The field-test is an opportunity for the problem solver to obtain evidence as to whether or not the solution alternative chosen met the specific requirements outlined in Section 2.0. Up to this point, the problem solving sequence has allowed the planner to objectively analyze and seek an answer to his problem. He should now be in a position to determine if he will "go" with the alternative chosen and field-tested or whether he needs to modify or abandon that particular alternative and seek another for field-testing.

6.1 Analyze Field-Test Findings

The alternative solution selected for the field-test phase was selected because it held the greatest promise for success. The culminated result of the field-test must now establish to what extent the selected solution was successful.

A summary of the findings should focus on the solution criteria established in Section 2.0. Each component identified in the problem should be analyzed separately. The results of this activity should provide the basis for reporting the findings and offering recommendations.

6.2 Presentation of Findings, Conclusions and Recommendations

The principal parties concerned with the outcome of the field-test and subsequent recommendations should receive a written summary of the study and have an opportunity to hear an oral report. The follow-up phase of the problem solving sequence represents a critical point. Either responsible change, when called for, is implemented on a broader scale or much of the potential in systematic problem solving will go untapped.

The format and styles will vary but a thorough report might contain the following:

1. Review of the problem complete with any in-depth analysis of the problem.

2. Review of solution criteria: (1) solution requirements (musts and shoulds) and (2) solution constraints.

3. Review all feasible alternatives to solving the problem and why the particular alternative was selected.

4. Review the field-test process: (1) the design selected, (2) the evaluation team, and (3) the field-test schedule.

5. Review field-testing findings matched with problem components.

6. Review recommendations

7. Questions and answers.

6.3 Summary

The field-test phase of the problem solving sequence provides a basis for future action. If the solution alternative selected demonstrates its viability as a result of the field-test, then its adoption is appropriate. On the otherhand, if the field-test findings suggest that the dividends resulting from the tested solution is questionable, then it may be abandoned or modified and subject to further study.